SECTION 33 7311

PAD-MOUNTED TRANSFORMER ROUGH-IN

****

LANL MASTER SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the ESM Electrical POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within “stars” during editing.

Specification developed for ML-3 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

In addition to a pad for the transformer, containment for transformer oil may be required by ESM Chapter 7, Section G4010, Parts 10.4 and 18.0 environmental or fire protection reasons. Detail such containment structures on the Drawings.

****

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish and install rough-in for pad-mounted utility transformer including the following:

1. Transformer pad.
2. Underground ductbank for medium-voltage cables.
3. Underground secondary service.
4. Grounding provisions.

****

Edit the following article to match project requirements; delete if containment is not required. Refer to ESM Chapter 7, Section G4010, Parts 10.4 and 18.0 for containment requirements. Detail containment structures on the Drawings.

****

5. Transformer oil containment provisions.

1.2 LANL WORK

A. LANL Support Services Subcontractor will furnish, install, and test pad mounted transformer.

B. LANL Support Services Subcontractor will furnish, install, and test medium-voltage cables.

1.3 SUBMITTALS

A. Construction Submittals: None

1.4 QUALITY ASSURANCE

A. Comply with the requirements of the National Electrical Code and IEEE C2 National Electrical Safety Code.

1.5 SEQUENCING AND SCHEDULING

A. Coordinate rough-in for pad-mounted transformer with the LANL Support Services Subcontractor.

B. Schedule an inspection of the transformer pad before concrete is placed.

PART 2 PRODUCTS

2.1 PAD-MOUNTED TRANSFORMER (GFE)

A. The LANL Support Services Subcontractor will furnish a compartment type, self-cooled, tamperproof and weatherproof pad-mounted transformer that will comply with the following ANSI/IEEE standards:

1. ANSI/IEEE C57.12.22–Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers with High-Voltage Bushings; High Voltage, 34500 GrdY/19920 Volts and Below; 2500 kVA and Smaller.

2. ANSI C57.12.00–General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.

3. ANSI/IEEE C57.12.27–Conformance Requirements for Liquid-Filled, Distribution Transformers Used in Pad-Mounted Installations, Including Unit Substations.

2.2 CONCRETE FORMWORK

****
Edit the following article to match specification sections used in Division 3.
****

A. Refer to Section 03 3001 Reinforced Concrete.

2.3 CONCRETE REINFORCEMENT

A. Use ASTM A615 Grade 60 reinforcing steel bars in transformer concrete pad.

****
Edit the following article to match specification sections used in Division 3.
****

B. Refer to Section 03 3001 Reinforced Concrete.

2.4 CAST-IN-PLACE CONCRETE

A. For transformer pad use concrete with minimum 3000 lb per sq ft strength, 4 to 6 percent entrained air, 3/4 inch maximum size aggregate.

****
Edit the following article to match specification sections used in Division 3.
****

B. Refer to Section 03 300 Reinforced Concrete.

2.5 UNDERGROUND DUCTBANKS AND MANHOLES

A. Refer to Section 33 7119, Electrical Underground Ducts and Manholes.

2.6 CONDUITS

A. Refer to Section 26 0533, Raceway and Boxes for Electrical Systems.

2.7 GROUNDING

A. Refer to Section 26 0526, Grounding and Bonding for Electrical Systems.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces and conditions, with Installer present, for compliance with installation tolerances and other conditions affecting rough-in for pad-mounted transformer. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 CONDUIT AND DUCT INSTALLATION

A. Terminate medium-voltage ducts in the primary compartment area of the transformer pad. Refer to Section 33 0513, Manholes and Structures, for installation requirements.

B. Terminate low-voltage conduits in the secondary compartment of the transformer. Refer to Section 26 0526, Raceways and Boxes for Electrical Systems.

C. Terminate each primary and secondary conduit with a bell end fitting set 2 inches above the top of the concrete pad.

3.3 CONCRETE PAD INSTALLATION

****
Refer to Drawing ST-G4010-38 for transformer concrete pad dimensions. Project-specific transformer pad construction details should be included in the Drawings.
****

A. Install reinforced concrete pad of suitable dimensions for pad-mounted transformer.

****
Edit the following article to match project requirements; delete if containment is not required. Refer to ESM Chapter 7, Section G4010, Parts 10.4 and 18.0 for containment requirements. Detail containment structures on the Drawings.
****

B. Install reinforced concrete transformer oil containment structure as indicated on the Drawings.

C. Prepare level, compacted pad site in accordance with Section 31 2000, Earth Moving

****
Edit the following article to match specification sections used in Division 3 and project requirements. A more substantial perimeter beam may be dictated by geotechnical conditions.
****

D. Form transformer pad [and oil containment structure] in accordance with Section [03 3001, Reinforced Concrete]

1. Provide pad with perimeter turn down beam that is not less than 8 inches wide and extends not less than 12 inches below grade.

****
Edit the following article to match specification sections used in Division 3 and project requirements.
****

E. Reinforce transformer pad [and oil containment structure] in accordance with Section [03 3001, Reinforced Concrete] and as detailed on the Drawings.

1. Extend reinforcing into perimeter beam.

2. Provide not less than 2 inches of concrete cover over reinforcing steel.

****
Edit the following article to match specification sections used in Division 3.
****

F. Place concrete in accordance with Section [03 3001, Reinforced Concrete]. Provide wood float finish with no depressions.

1. Chamfer top edges and corners.

2. Cure concrete not less than seven days before installing equipment.

G. Install not less than four 5/8 inch diameter galvanized steel anchor bolts set at least 4 inches into pad to anchor pad-mounted transformer to pad.

3.4 GROUNDING

A. Install a 10 ft driven ground rod below the secondary compartment area of the transformer pad. Provide 4/0 AWG ground cable and compression ground lug to connect ground rod to transformer ground pad in the secondary compartment.

B. Terminate medium-voltage duct bank ground cable in primary compartment area of the transformer pad. Provide compression ground lug to connect ground cable to transformer ground pad in the primary compartment.

C. Refer to Section 26 0526, Grounding and Bonding for Electrical Systems.

3.5 FIELD QUALITY CONTROL

A. After transformer pad is formed, conduits are installed, reinforcing bars are installed, but before concrete is placed, notify the LANL Support Services Subcontractor.

B. Allow 3 working days in schedule for inspection by the LANL Support Services Subcontractor.

C. Correct deficiencies noted before placing concrete.

3.6 TRANSFORMER INSTALLATION

A. The LANL Support Services Subcontractor will install the pad-mounted transformer on the concrete pad.

B. The LANL Support Services Subcontractor will install, test, and terminate the medium-voltage cables.

END OF SECTION

****

Do not delete the following reference information.

****

FOR LANL USE ONLY

This project specification is based on LANL Master Specification 33 7311 Rev. 0, dated January 6, 2006.